Space Weather Forecast

From the 24th of September, the way we distribute this forecast is changing and you will need to take action to continue receiving it. You should have received an email on the 4th of September explaining the steps required to do this. If you have already signed up to receive the forecast on our premium website, please disregard this message. If you haven't, or if you need help with the process, please contact moswoc@metoffice.gov.uk

Issued on Wednesday, 11 September 2024 at 00:11 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: G1-G2 minor-moderate geomagnetic storm is likely Wednesday 11 September. Slight chance of S1 minor radiation storm throughout. Another coronal mass ejection (CME) arrival is expected on Friday 13 Sep, with chance of G1-G2 minor-moderate storm, possibly a G3 strong storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate, with a peak Moderate-class flare from a sunspot region, which has now rotated just beyond the west limb.

There are currently nine sunspot regions on the visible disc, one of which is unnumbered in the southwest quadrant. Most of the active regions are now on the western hemisphere, with most of the regions relatively simple. The largest and most complex region is a sunspot region located near the north central meridian. This region consists of a delta spot on the leading portion of its large trailer spot. Another region Immediately east of this region has shown significant growth in the last 24 hours.

An asymmetric Coronal Mass Ejection (CME) was observed on satellite imagery during the early hours of the 10th, following a long-period Moderate-class flare from the large region in the north, near the central meridian. While the bulk of the ejecta is expected to pass north of Earth, a very faint halo was detected. The analysis revealed an estimated speed of 630 km/s, giving an arrival at Earth early on Day 3 (13 Sep).

Solar Wind / Geomagnetic Activity: The solar wind showed a possible stepped entry into a fast wind of unknown provenance. The solar wind speed was slightly elevated, gradually declining to background, ranging between 370-480 km/s. The magnetic field was mostly weak, while the north-south component varied throughout. The net result of the above solar wind measures was for mostly Quiet geomagnetic activity with two Unsettled intervals.

Energetic Particles / Solar Radiation: Solar radiation levels (10MeV protons in near-Earth environment) showed a gradual decreasing trend, eventually returning below the S1 / Minor Storm level at around 10/0750 UTC. Higher energy protons showed no notable response.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is likely to continue throughout, with a daily slight chance of Strong-class flares. The complexity and flare risk of oncoming sunspot regions is likely to exceed

© Crown Copyright 2024. All Rights Reserved.

that from any departures through midweek UTC, and the overall risk is upwards around this time.

Solar Wind / Geomagnetic Activity: The first one originated from a filament (arc of plasma) eruption early on 08 September, expected to arrive early day 1 (11 Sep). At the time of writing, it looks like the CME may have arrived at STEREO-A, which is slightly ahead of Earth's orbit. The orientation of the Earth's magnetic field remains positive (northward directed) which does not favour significant geomagnetic activity. Still anticipating its arrival at Earth early on day 1 (11 Sep).

The second one followed an Moderate-class flare early on 10 Sep, expected to arrive early on day 3 (13 Sep), with its affects possibly lingering into day 4 (14 Sep), which may also coincide with the arrival of a coronal hole fast wind.

Energetic Particles / Solar Radiation: A heightened risk of flare activity brings a daily chance of reaching/exceeding the S1 Minor Radiation storm level, should any significant flares occur from active regions in the western hemisphere.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	10	60	20
Strong	G3	No	10	1	20	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	60	70	70
Very Active	R3 to R5 X	No	10	10	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.